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BY THE COMPTROLLER GENERAL

Report To The Chairman, Subcommittee On Defense, Committee On Appropriations, House Of Representatives

OF THE UNITED STATES

COMPLETED

Adjustments Recommended In Fiscal Year 1982 Ammunition Procurement And Modernization Programs

At the request of the Subcommittee on Defense of the House Committee on Appropriations, GAO has reviewed the military services' annual requests for funds to purchase ammunition and to modernize ammunition production facilities. GAO's review was limited primarily to those items involving large dollar amounts or items being bought for the first time.

GAO recommends that the Committee (1) reduce the services' $3.7 billion request for items by $157.9 million, (2) reduce the Army's $306.4 million request for the ammunition production base by $15.3 million, and (3) closely monitor the ammunition programs for three items until problems are resolved.

PLRD-81-35
JUNE 30, 1981

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

B-203512

The Honorable Joseph P. Addabbo
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

Your September 30, 1980, letter asked us to review the military services' justifications for their fiscal year 1982 appropriation requests for the procurement of conventional ammunition and the ammunition production base.

As requested, we limited our review to evaluating (1) the Army, Navy, and Air Force requests for ammunition end-items costing large dollar amounts and end-items being bought for the first time and (2) Army projects for establishing, modernizing, and expanding the ammunition production base. On the basis of our evaluations, we are recommending that your Committee reduce the services' requests by $173.2 million and closely monitor three ammunition items to assure that corrective actions are taken.

As requested also, we made some followup inquiries to determine the status of the Department of Defense actions to implement recommendations made in our November 1979 report on the single manager for conventional ammunition. Generally, we concluded that progress toward further implementation of the single manager program has been limited.

On March 13, 1981, we gave your Office the requested fact sheets and questions for use during the Committee's appropriations hearings. This report provides additional information on the results of our review.

As arranged with your Office, we are reviewing separately the adequacy of the programs under which ammunition stocks are stored and maintained by the services. We will provide you the results of this separate review before markup of the 1982 Defense appropriation bill.

As directed by the Committee, we did not obtain agency comments on the matters discussed in this report.

As arranged with your Office, we are sending copies of this report to the Chairmen, House Committees on Armed Services and on Government Operations and the Senate Committees on Appropriations, on Armed Services, and on Governmental Affairs; the Director, Office of Management and Budget; and the Secretaries of Defense, the Army, the Navy, and the Air Force. Copies will be made available to other interested parties upon request.

Sincerely yours,

Milton J. Socolar

Acting Comptroller General
of the United States

COMPTROLLER GENERAL'S
REPORT TO THE CHAIRMAN,
SUBCOMMITTEE ON DEFENSE,
HOUSE COMMITTEE ON
APPROPRIATIONS

ADJUSTMENTS RECOMMENDED IN FISCAL YEAR 1982 AMMUNITION PROCUREMENT AND MODERNIZATION PROGRAMS

D I G E S T

In January 1981, the Army, Navy, and Air Force requested about $2.6 billion for fiscal year 1982 ammunition and related support activity programs. In March 1981, these requests were superseded by budget amendments which increased the requests to about $3.7 billion for ammunition--$2.14 billion for 60 Army items, $419.7 million for 21 Navy items, and $1.1 billion for 53 Air Force items--and $306.4 million for ammunition production base support activities.

GAO's detailed review was done before the services amended their requests. However, this report includes an evaluation of the amended budget requests and discusses the impact of the amendments on GAO's positions.

AMMUNITION

GAO reviewed the justifications for items involving primarily large dollar amounts and those being bought for the first time. GAO's review excluded Navy and Air Force items still being developed and the Army's Copperhead system--a cannon-launched guided projectile. However, this report does summarize past and present Copperhead system issues.

Army

The review included 33 conventional ammunition items and 2 miscellaneous categories representing $1.4 billion, or 66 percent, of the Army's $2.1 billion request.

GAO concluded that the request for eight of the conventional ammunition items should be reduced by $133.6 million.

--About $41.4 million of the $83.3 million for M119A2 propelling charges is not needed in fiscal year 1982. The Army needs only 330,000 propelling charges rather than the requested 645,000. The requested program would provide sufficient inventory to meet anticipated needs until 1985. As it is, the Army, as of

Tear Sheet. Upon removal, the report cover date should be noted hereon.

September 30, 1980, already had 1.7 million undelivered charges. (See p. 5.)

--The $12.5 million for 553,000 M739 point detonating fuzes is premature because of production backlogs. (See p. 6.)

--The $44.7 million for 398,000 81-mm. high-explosive M374A3 mortar rounds is premature because the sole producer of propellant increments has not manufactured a product that will pass acceptance tests and has insufficient capacity to produce the increments needed. Further, if this round is replaced, as currently anticipated, existing inventory levels would be sufficient to meet future requirements. (See p. 7.)

--The $12.3 million for 225,000 30-mm. XM789 antiarmor/antipersonnel cartridges is premature because the cartridges are for use in the AH-64 helicopter, which has deficiencies that must be resolved before production. Also, there are unresolved problems with the round exploding in the gun barrel. (See p. 8.)

--The $1.6 million for 100,000 30-mm. XM788 target practice cartridges is also premature because the cartridges, planned for use in the AH-64, would not be needed until the helicopters' scheduled deliveries begin in December 1983. Also, there are unresolved problems with the projectile breaking up in mid-air. (See p. 9.)

--The $21.1 million for four items (the M203 propelling charges, 20-mm. cartridges, 14.5-mm. cartridges, and 7.62-mm. cartridges) is not needed because existing inventory and quantities due-in from funded programs exceed requirements. (See p. 10.)

In addition, the Committee should be aware of technical, production, or performance problems with three items for which the Army has requested $180.9 million.

--$101.8 million for 198,000 155-mm. improved conventional munition projectiles. (See p. 15.)

--$58.2 million for 91,000 105-mm. antitank cartridges. (See p. 17.)

--$20.9 million for 30,000 155-mm. rocket-assisted projectiles. (See p. 18.)

Navy

The review included selective items in six program budget lines that represented $200.6 million, or 48 percent, of the Navy's $419.7 million request for ammunition.

GAO concluded that the amount requested for four conventional ammunition items should be reduced by $13.8 million.

--Only half of the $6 million requested for 64,900 conical fins for MK82 bombs is needed because only half of the requested quantity can be produced during the fiscal year 1982 program. (See p. 19.)

--The request for nonthermal protected MK84 inert practice bombs and MK81 inert bombs should be reduced by $4.1 million because the Navy can use bomb bodies already in inventory. (See pp. 19 and 20.)

--The $6.5 million requested for 5-inch/54 caliber variable time nonfragmentation projectiles is not needed because the Navy has an adequate inventory to meet projected needs. (See p. 20.)

--The $0.2 million requested for 5.56-mm. linked cartridges is not needed because of a production backlog. (See p. 21.)

Air Force

The review included 15 items representing $439.7 million, or 39 percent, of the Air Force's $1.1 billion request for ammunition.

GAO concluded that the request for two items should be reduced by $10.5 million.

--The $7.2 million requested for .38 caliber rounds should be reduced by $1.9 million because the items can be procured commercially at a lower cost than estimated in the budget. (See p. 23.)

--The $8.6 million requested for RR-170 chaff cartridges is not needed during fiscal year 1982 because of a large production backlog. (See p. 25.)

Tear Sheet

MODERNIZATION AND EXPANSION

After reviewing 9 of the 17 projects representing $91.9 million, or 73 percent, of the January 1981 budget request of $125.5 million for modernization and expansion projects, GAO concluded that:

--The $9.5 million requested for a steam tieline at the Radford Army Ammunition Plant is not adequately justified. The Army agrees that the project should be withdrawn. (See p. 28.)

--It is too soon to provide $5.8 million for redistributing excess equipment because the full scope of effort and detailed plans, including firm cost estimates, have not been developed. (See p. 29.)

GAO also raised some issues concerning the Army's estimated costs for completing the Mississippi Army Ammunition Plant for consideration by the Committee when making funding decisions. (See p. 31.)

OTHER MATTERS

The Department of Defense has made only limited progress toward further implementing the single manager for conventional ammunition. GAO believes that the concept is sound and that if it is fully implemented, ammunition management will be more efficient, effective, and economical. Defense is working on a revised directive which will add to the single manager's control and strengthen the organization. The effect of the revised directive is unknown. (See p. 33.)

The Army has not resolved problems concerning the effectiveness of the Copperhead system against moving targets and under battlefield conditions. Further, the Army is forecasting considerable cost increases for the fiscal year 1980 program. The Army is planning Copperhead II, which is supposed to enhance certain features of the system. (See p. 35.)

RECOMMENDATIONS

GAO recommends that the Committee

--reduce the Army's conventional ammunition request for eight items by $133.6 million and

closely monitor the ammunition programs for three items until the Army resolves various problems (see p. 18),

--reduce the Navy's conventional ammunition request for four items by $13.8 million (see p. 22),

--reduce the Air Force's conventional ammunition request for two items by $10.5 million (see p. 26), and

--reduce the Army's request for modernizing and expanding the ammunition production base by $15.3 million (see p. 32).

AGENCY COMMENTS

As directed by the Committee, GAO did not obtain agency comments on the matters discussed in this report.

Contents

		Page
DIGEST		i
CHAPTER		
1	INTRODUCTION	1
	Objectives, scope, and methodology	2
2	ARMY AMMUNITION ITEMS	5
	Undelivered funded programs	5
	Premature procurement	7
	Inventory exceeds requirements	10
	Items requiring special attention	14
	Conclusions	18
	Recommendations	18
3	NAVY AMMUNITION ITEMS	19
	Conical fins for MK82 practice bombs	19
	MK84 inert practice bombs	19
	MK81 inert bombs	20
	5-inch/54 caliber variable time nonfragmentation projectile	20
	5.56-mm. linked cartridge	21
	Conclusion	21
	Recommendation	22
4	AIR FORCE AMMUNITION ITEMS	23
	.38 caliber ball cartridge	23
	Production backlog for RR-170 chaff cartridge	25
	Conclusion	26
	Recommendation	26
5	AMMUNITION PLANT MODERNIZATION AND EXPANSION PROGRAM	27
	Project 5822134	28
	Project 5823186	29
	Project 5823142	31
	Conclusions	32
	Recommendations	32
6	OTHER MATTERS	33
	Single manager for conventional ammunition	33
	Copperhead	35

APPENDIX		Page
I	GAO recommended adjustments to the Army's ammunition request	38
II	GAO recommended adjustments to the Navy's ammunition request	42
III	GAO recommended adjustments to the Air Force's ammunition request	43
IV	GAO recommended adjustments to the Army's modernization and expansion program request	45

CHAPTER 1

INTRODUCTION

In January 1981, the Army, Navy, and Air Force requested about $2.6 billion for fiscal year 1982 ammunition and related support activity programs. In March 1981, these requests were superseded by budget amendments which increased the requests to $3,984.9 million--$3,678.5 million requested by the services for ammunition items and $306.4 million requested by the Army for ammunition production base support. The services' requests for ammunition items are summarized below.

Items by service	No. of items	Amount (millions)
Army:		
Atomic materiel	2	$ 25.1
Conventional ammunition	52	2,039.1
Miscellaneous	6	73.9
Total	60	2,138.1
Navy:		
Air launched ordnance	14	253.8
Ship gun ammunition	6	136.7
Small arms ammunition	1	29.2
Total	21	419.7
Air Force:		
Rockets and launchers	1	0.1
Cartridges	20	502.1
Bombs	12	461.4
Targets	2	13.0
Fuzes	5	51.2
Other items	13	92.9
Total	53	1,120.7
Total	134	$3,678.5

A summary of the Army's request for $306.4 million for ammunition production base support is as follows.

Purpose	Amount (millions)
Provision of industrial facilities:	
Modernization, expansion, and initial production facilities	$187.6
Production support and equipment replacement	50.7
Total	238.3
Layaway of industrial facilities	29.9
Manufacturing technology program	27.9
Depot maintenance plant equipment	10.3
Total	$306.4

The ammunition request is planned to provide annual peacetime training needs and to build war reserve stocks. It includes items ranging from .22 caliber cartridges to major caliber artillery projectiles and bombs.

OBJECTIVES, SCOPE, AND METHODOLOGY

Our objectives were to assess the adequacy of justifications for specific ammunition items and projects in the fiscal year 1982 appropriation request, assess actions taken by the Department of Defense with respect to the single manager for conventional ammunition program, and make inquiries into minimum sustaining rates, the working capital fund, and the small arms ammunition reload program.

As the Committee requested, we evaluated requests for ammunition items involving large dollar amounts and items being bought for the first time. We did not do a detailed review of all ammunition items. In selecting ammunition items for review, we first reviewed basic data, such as requirements, inventory position, problems in production, quality, testing and development, production backlog, potential item obsolescence, and reprograming of prior year's funds. This basic data surfaced those items with probable problems (e.g., excess inventory). We concentrated on items which appeared to need top management's attention.

Also, as requested, we reviewed projects for establishing, modernizing, and expanding the ammunition production base. We selected nine projects involving large dollar amounts.

Because of time constraints, we limited our review primarily to justification documents for the items and projects and to the status and results of testing for newer items. Because of the complexity of the requirements determination process and tight time constraints, we were unable to completely validate the requirements figures. While we did not have time to verify data, such as inventory positions and cost estimates on a current basis, we

were able to assess the reasonableness of such data for many of the items we reviewed in prior years. As agreed with the Committee, we did not review Navy and Air Force ammunition items still being developed and the Army's request for the Copperhead. However, as further agreed, we obtained additional information on current issues concerning the Copperhead system. Further, since the services submitted their fiscal year 1982 amended budget requests after we finished our fieldwork, we limited our review to (1) evaluating the services' requests as of January 1981 and (2) assessing the impact of the amended requests on our conclusions for items with which we are taking issue.

Our review of implementation of the single manager concept for conventional ammunition was limited to discussions with ammunition management officials in the Office of the Secretary of Defense and in the single manager's organization. We also reviewed documents, such as directives and progress reports provided by these officials.

In reviewing the justifications for specific ammunition items and projects, we interviewed officials involved in ammunition management and procurement and obtained documents, such as briefings, status reports, production problem meeting minutes, and budget support data, from the Department of Defense and services at the following locations:

--Office of the Under Secretary of Defense for Research and Engineering, Washington, D.C.

--Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics), Washington, D.C.

--Headquarters, Department of the Army, Washington, D.C.

--Office, Chief of Naval Operations, Washington, D.C.

--Naval Air Systems Command, Washington, D.C.

--Naval Sea Systems Command, Washington, D.C.

--Ships Parts Control Center, Mechanicsburg, Pennsylvania.

--U.S. Air Force Systems Command, Armament Division, Eglin Air Force Base, Florida.

--Ogden Air Logistics Center, Hill Air Force Base, Utah.

--U.S. Army Munitions Production Base Modernization Agency, Dover, New Jersey.

--U.S. Army Armament Research and Development Command, Dover, New Jersey.

--U.S. Army Armament Materiel Readiness Command, Rock Island, Illinois.

--Army Materiel Systems Analysis Activity, Aberdeen, Maryland.

--Product Manager's Office for 30-mm. Ammunition, Dover, New Jersey.

In April 1981, we discussed this report with responsible officials of the Army's Office of the Deputy Chief of Staff for Research, Development, and Acquisition; the Navy's Office of the Deputy Chief of Naval Operations for Logistics; and the Air Force's Office of the Deputy Chief of Staff for Logistics and Engineering. Changes were made to the report, where appropriate, to reflect specific comments.

CHAPTER 2

ARMY AMMUNITION ITEMS

The Army's amended request for fiscal year 1982 was $2,113 million for the procurement of 52 conventional ammunition items and 6 miscellaneous items and $25.1 million for 2 atomic materiel items. We examined the Army's justification for 33 ammunition items and 2 miscellaneous categories costing $1,393.2 million, or 66 percent of the request. Justification was adequate for most items. However, we concluded that adjustments of $133.6 million were necessary for the following reasons:

--A total of $53.9 million of the $95.8 million requested for two items is unnecessary because large undelivered funded programs could be extended to maintain an active production base for a longer period.

--The $58.6 million requested for three items is premature until various issues are resolved.

--The $21.1 million for four items is unnecessary because inventory exceeds requirements.

Finally, the Committee should be aware of technical, production, or performance problems with three items for which the Army is requesting $180.9 million.

UNDELIVERED FUNDED PROGRAMS

A total of $41.4 million requested for the 155-mm. M119A2 propelling charge and $12.5 million requested for the M739 point detonating fuze is not needed because undelivered funded programs can be extended. This would maintain both a more uniform production level and an active production base for a longer period.

155-mm. M119A2 propelling charge

The Army requested $83.3 million for 645,000 M119A2 propelling charges. In building the inventory for propelling charges, the Army attempts to balance it with the inventory of projectiles that use the propelling charge. The Army estimates it needs 2,165,000 M119A2 propelling charges by the end of the fiscal year 1982 program to balance with anticipated projectile inventories. However, if funding is provided in fiscal year 1982 for 645,000 charges, there will be 2,651,000 charges in the inventory, enough to meet the anticipated needs until the end of the fiscal year 1984 program. This excess may force shutdown of M119A2 production.

As of September 30, 1980, the Army had 1.7 million undelivered charges funded under existing programs. The Army has scheduled delivery of these charges far above one-shift production rates. By changing the schedule to one-shift rates, production of existing programs could be stretched into the fiscal year 1982 delivery

period. The Army estimates that a fiscal year 1982 program of 330,000 propelling charges is needed to stretch the program through the fiscal year 1982 funded delivery period. This would reduce the quantity of M119A2 propelling charges by 315,000 and the cost by about $41.4 million.

Army representatives agreed that by fully funding the requested fiscal year 1982 program for the M119A2 propelling charges, the Army would have more M119A2 propelling charges than needed by the end of the fiscal year 1982 funded delivery period. In fact, they said that with the requested fiscal year 1982 program, the Army would not need to buy additional M119A2 propelling charges in either fiscal year 1983 or 1984. Finally, the Army representatives said that the fiscal year 1981 and prior programs could not be stretched through the 1982 funded delivery period to maintain continuity until a fiscal year 1983 program. A shortfall of about 330,000 propelling charges would exist without a fiscal year 1982 program.

M739 point detonating fuze

The $12.5 million request for 553,000 M739 point detonating fuzes should not be funded since fuzes from prior funded programs have not been delivered and the point detonating fuze inventory is near its required quantity. During fiscal year 1981 hearings, the Army assured the Committee that it would eliminate the backlog. The Army also provided the Committee with a production delivery schedule for the fiscal year 1980 and prior year programs. For example, in April 1980 the Army estimated that the 1979 and prior year program deliveries would be completed in September 1981 and the 1980 program deliveries would be completed in February 1982. These schedules have now slipped to February 1982 and June 1982, respectively.

The Army contends that it needs a fiscal year 1982 program for the point detonating fuze to prevent a deficit of 676,000 fuzes at the end of the fiscal year 1982 program. In assessing the need for the program, we noted that the Army understated its inventory position for another point detonating fuze--the M557--by 313,000. Also, the Army reduced the fiscal year 1980 program by 308,000 fuzes and reprogramed the funds.

The Army plans to increase production rates of its current three contractors to eliminate the backlog prior to the fiscal year 1982 program. However, the Army can keep the fuze production base active by utilizing one or two contractors to produce prior years programs through the fiscal year 1982 funded delivery period without additional funding.

Army representatives said that a fiscal year 1982 program is needed to retain contractors and provide competition. We realize the Army wants to maintain active contractors and foster competition and agree that this should be done. However, because the current inventory position is high, we concluded that it is

merely a question of time before all production lines for both the fuze and components will have to be shut down.

PREMATURE PROCUREMENT

The Army's fiscal year 1982 program included premature requests for the following items:

--$44.7 million for 81-mm. high explosive cartridges.

--$12.3 million for 30-mm. high explosive cartridges.

--$1.6 million for 30-mm. target practice cartridges.

81-mm. high explosive cartridge

The Army's request of $44.7 million for 399,000 81-mm. high explosive M374A3 mortar cartridges should not be funded because

--there is no assurance that the prospective producer of propellant increments will manufacture a product that will pass first article acceptance tests,

--this producer does not have sufficient capacity to produce the quantity of propellant increments needed, and

--if the item is replaced the requirements will drop well below the inventory level.

The M374A3, an improved version of its predecessor the M374A2, has a redesigned propellant charge container that provides increased reliability in wet weather, permits faster firing range changes, and eliminates most firing residue in the mortar tube.

The Army planned to produce the M374A3 version in fiscal year 1978 and subsequent programs, but was unable to obtain an acceptable bid for propellant charge increments. As a result, the Army produced the earlier M374A2 version in its fiscal year 1978 and 1979 programs. There was no fiscal year 1980 program. Army officials told us they will not produce the M374A2 in its fiscal year 1981 and 1982 programs.

The Army now has one prospective increment producer for producing the M374A3 version for its fiscal year 1981 and proposed 1982 programs. However, this producer is not scheduled to supply increments for first article tests until August 1981. First article testing is necessary to ensure the contractor has the capability to produce the item according to specifications.

In addition, this producer does not currently have the capacity to supply the increments needed to complete the fiscal year 1981 and 1982 programs on schedule. Some 2,152,000 increments must be produced before August 1983 to meet production schedules.

However, since the producer's capacity is 40,000 increments per month and production is scheduled to start in September 1981, only 838,000 can be delivered. Procurement leadtime for getting another contractor is 18 months.

The Army estimates that if it decides to purchase the 81-mm. improved United Kingdom (XM821) round, the M374A3 requirements will drop from its current level of 7,603,000 rounds to a level of 762,000 rounds. The Army will have approximately 4 million rounds in inventory after delivery of its fiscal year 1981 program. This quantity will far exceed requirements if the XM821 is purchased. The Army estimates that the XM821 could be type classified by the fourth quarter of fiscal year 1983 and be eligible for procurement in the Army's fiscal year 1984 program.

Army representatives said that although the producer's capacity is limited to 40,000 propellant increments a month, the contractor has expressed a willingness to expand its production capacity. Because the producer does not currently have the capacity to produce the quantities requested in the budget, we believe it is premature to provide additional funds for this item.

30-mm. high explosive, dual purpose cartridge

This $12.3 million request is for 225,000 30-mm. XM789 antiarmor/antipersonnel cartridges for use in the Army's XM230 chain gun. The chain gun and 2.75-inch rockets are the secondary armament systems for the new AH-64 advanced attack helicopter.

The Army plans to award the first XM789 production contract in January 1982 to enable early production facilities prove out and to obtain initial inventory quantities. However, we believe that funding is premature because:

--AH-64 testing disclosed deficiencies which must be overcome prior to production.

--Testing to demonstrate that the ammunition is ready for production and to evaluate critical fixes to overcome a serious deficiency is in the early stages.

--Delaying procurement until fiscal year 1983 would provide ammunition at about the same time the first AH-64 is scheduled for delivery.

The AH-64 deficiencies were discussed in our February 12, 1981, report. 1/ We recommended that:

"* * * the Congress place restrictions on the obligation of fiscal year 1982 procurement funds for the AH-64 and

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1/"Problems Affecting the Procurement and Operation of the Army's AH-64 Attack Helicopter and Associated Systems" (C-MASAD-81-1).

laser Hellfire until the Secretary of Defense has assured the House and Senate Armed Services and Appropriations Committees that the system's critical technical problems have been corrected."

We also made other recommendations relating to the adequacy of the AH-64 operational testing, the compatability between the AH-64 and a scout helicopter, and the Army's affordability problems with both the AH-64 and the scout helicopters. The Army Materiel Systems Analysis Activity will independently evaluate the AH-64 development test results. The Activity's evaluation, originally planned for completion in November 1981, will be delayed because of deficiencies found during AH-64 testing.

In June 1979, during initial weapon compatability testing, an XM789 cartridge exploded in the barrel of a chain gun. After extensive analysis, the contractor and the Army agreed on necessary corrections to the cartridge. In October 1980, the Army believed that all corrections had been incorporated into production. However, in November 1980, another inbore occurred during cartridge lot acceptance testing. This malfunction was attributed to the materials used for one of the corrections.

The final phase of XM789 development testing was scheduled for completion in May 1981. As of February 1981, only 4 of 43 planned tests were completed. Testing to evaluate the cartridge when fired from the AH-64 is scheduled during July through September 1981.

The Army believes an XM789 buy in fiscal year 1982 will provide early prove out of commercial metal parts producers, a fuze assembly line, and a cartridge load, assemble, and pack facility. The fuze assembly line prove out was completed in September 1980. The cartridge load, assemble, and pack line is complete except for two equipment modules which will undergo testing at the manufacturer's plant prior to delivery and be ready for production in July 1982. However, the Munitions Production Base Modernization Agency believes minimal line prove out will be needed.

Army representatives said that the 30-mm. ammunition program is needed in fiscal year 1982 to assure ammunition for the AH-64 helicopters when they are delivered. However, in view of the technical problems, it may be wise to defer funding until the technical problems are resolved, especially since delivery of the AH-64 helicopter is not scheduled to begin until December 1983. Deferring procurement until the fiscal year 1983 program would coincide with initial deliveries of the helicopters.

30-mm. target practice cartridge

This $1.6 million request is for 100,000 30-mm. XM788 target practice cartridges. These cartridges are ballistically matched with the XM789 tactical round. Both cartridges are used with the XM230 chain gun mounted on the AH-64 advanced attack helicopter.

The Army is requesting the target practice cartridges in fiscal year 1982 to meet training requirements on initial production AH-64 helicopters. However, we believe this request is premature because projectile breakups have not been resolved and the funding would provide ammunition deliveries about 1 year before needed for the Army's AH-64.

Although the XM788 ammunition development testing was successful, malfunctions occurred when using this cartridge to test the chain gun. The malfunctions damaged the gun's blast suppressor and other components. Contractor and Army teams evaluated the use of the cartridge with the chain gun and the Army concluded in August 1980 that XM788 inspection methods were inadequate. Ultrasonic inspection equipment was developed to identify defective projectiles that could potentially breakup. A 33-percent rejection rate occurred, however, testing in December 1980 revealed that projectile breakups continued to occur with cartridges which passed inspection. The contractor adjusted the ultrasonic inspection equipment to insure that all projectiles with even minimal flaws were rejected. This resulted in a 60-percent cartridge rejection rate.

In February 1981 the Army concluded that projectile breakup is caused by high sulfur steel used in the projectile body. To correct this deficiency, the Army proposes to use a more durable steel. Initial deliveries of cartridges produced with the substitute steel were expected in April 1981; after which, projectile retesting was scheduled to begin.

The fiscal year 1982 program request is scheduled for initial delivery in December 1982. Delivery of AH-64 helicopters is not scheduled to begin until December 1983 at a rate of one per month for the first 8 months. An initial procurement of XM788 cartridges in fiscal year 1983 would coincide with initial deliveries of the AH-64.

INVENTORY EXCEEDS REQUIREMENTS

The Army's request for $21.1 million should not be funded for the following items because inventory exceeds requirements.

--$14.5 million for M203 propelling charges.

--$4.2 million for 20-mm. cartridges.

--$1.6 million for 14.5-mm. cartridges.

--$0.8 million for 7.62-mm. cartridges.

155-mm. M203 propelling charge

The Army requested $14.5 million for 60,000 155-mm. M203 propelling charges. However, this program is not needed because inventory and undelivered quantities exceed requirements.

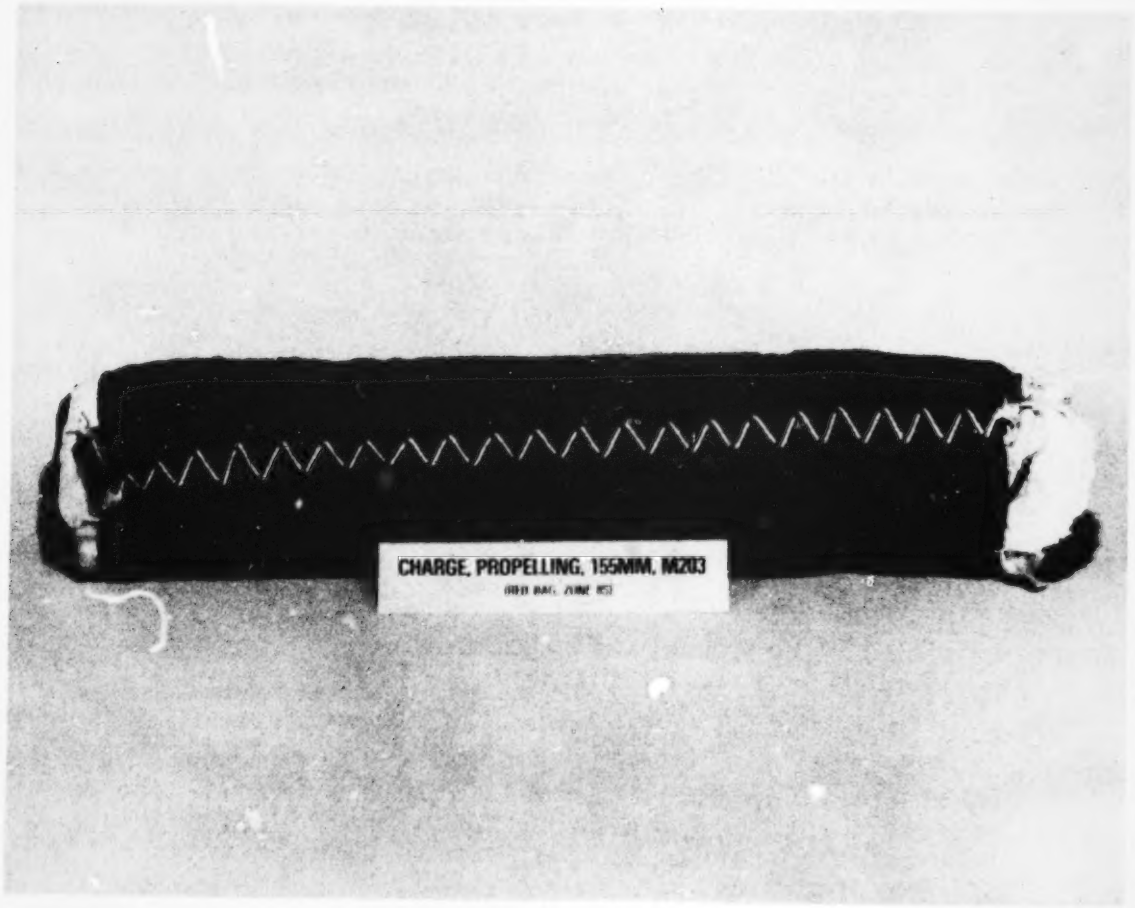
The inventory requirements have dropped sharply because of restrictions on M203's use. The charge's high blast and pressure levels limit its use to the M198 howitzer and two fielded projectiles--the M483A1 improved conventional munition and the M549A1 rocket-assisted projectile.

As illustrated by the following table, inventory and existing undelivered program quantities far exceed quantities needed at the end of the fiscal year 1982 program period.

	Quantity
Inventory at September 30, 1980	35,000
Due in from funded programs	157,000
Total	192,000
Estimated consumption through end of 1982 program period	-12,000
Inventory at end of 1982 program period	180,000
Propelling charge requirements balanced to anticipated projectile inventories	
End of 1982 program period	54,000
End of 1987 program period	182,000

In addition, the M483A1 is presently restricted from use with the M203 due to projectile malfunctions during testing. If this restriction should become permament, requirements for the M203 will drop further. Finally, the Army has a product improvement program for the M203 propelling charge which the Army expects to introduce into the inventory in fiscal year 1985.

Army representatives said that the Army plans to maintain an active production line through fiscal year 1984 pending a product improved charge in fiscal year 1985. However, our review disclosed that the existing and undelivered program of M203 propelling charges exceed requirements. Also, because a product improved charge is being developed to take the place of the current M203 charge, it may not be wise to build a big inventory of the unimproved M203 charge. Under these circumstances, we believe that additional funds should not be provided for this item during fiscal year 1982. With regard to maintaining an active production line, this can best be done by stretching the undelivered M119A2 programs as discussed earlier. Finally, the M203 quantities requested by the Army in the fiscal year 1982 program would only support M203 production for 1 month.



SOURCE: U.S. ARMY

20-mm. cartridges

The Army requested $14.9 million for two varieties of 20-mm. cartridges, including $4.2 million for 840,000 rounds configured for the Vulcan weapon system. However, actual training consumption during the most recent program year was substantially less than projected. The Army projected Vulcan round consumption at 4,565,000 cartridges for the 17-month program period ending February 1981, but actual consumption was only 1,930,300.

After adjusting for this difference, the projected inventory after the fiscal year 1981 program will be 2,491,700 cartridges. This quantity exceeds the 929,000 authorized acquisition objective and projected 1982 training usage of 647,000 cartridges.

Army representatives said that the 20-mm. Vulcan program is needed in fiscal year 1982 because a contractor failed to deliver about 800,000 cartridges funded in the past. In addition, the fiscal year 1979 funded delivery period has been extended by 6 months and the Army expects to consume 2,665,000 cartridges

during training from February 1981 to July 1981. This compares to the actual consumption of 1.9 million rounds during the 17-month period ending in January 1981. While the Army may not receive all of the prior years programs because of a contractor default, our computations show that the Army will have enough rounds in inventory after the fiscal year 1981 program to meet the authorized acquisition and projected fiscal year 1982 training needs.

14.5-mm. cartridges

The request included $1.6 million for three different 14.5-mm. training cartridges used to simulate field artillery fire.

Type	Quantity	Cost
Point detonating fuze	401,000	$1,400,000
3-second fuze	24,000	100,000
6-second fuze	24,000	100,000
Total	449,000	$1,600,000

The fiscal year 1982 program is not needed because existing inventories are sufficient to meet depot requirements and training consumption well beyond the fiscal year 1982 program period.

The following table shows the inventory in relation to requirements and differences between actual and planned consumption.

Type cartridge	1/31/81 inventory	Depot requirement	Consumption Planned (note a)	Consumption Actual (note b)
Point detonating fuze	1,239,600	165,000	638,000	237,000
3-second fuze	173,000	20,000	109,000	14,000
6-second fuze	142,500	18,000	79,000	13,000
Total	1,555,100	203,000	826,000	264,000

a/Average projected for program years 1981 through 1986.

b/Average for fiscal years 1978, 1979, and 1980.

Although planned consumption supports the quantities requested, actual usage has been substantially less than the original forecast, and is not expected to increase significantly. Current inventories can therefore be used to meet depot and training needs through the fiscal year 1982 program period and funding is not required. Officials at the U.S. Army Armament Materiel Readiness Command agreed that the proposed program is not needed.

Concerning the 14.5-mm. cartridges, Army representatives said that the fiscal year 1982 training authorizations for high explosive artillery rounds are expected to be drastically reduced from historical usage. They also said that this action is expected to increase the demand for the 14.5-mm. cartridge and that these expected increases will more than support the requested fiscal year request along with ensuring production lines remain active. While we support the use of this lower cost round for training purposes, we believe there are sufficient rounds in the inventory to permit demonstration of increased demand for the 14.5-mm. rounds. Further, keeping production lines active would not seem to be an issue since, according to an Army procurement representative, the 14.5-mm. rounds are procured from an off-shore commercial source.

7.62-mm. rifle grenade cartridges

The Army requested $31.9 million for a variety of 7.62-mm. cartridges, including $800,000 for 2,411,000 rifle grenade cartridges. The rifle grenade cartridge program is not needed since the projected inventory exceeds requirements. The projected inventory position of 18,734,000 cartridges after the fiscal year 1981 program is more than enough to meet the 578,000 cartridge inventory objective and the combined 1982 through 1984 training requirement of 16,471,000 cartridges.

Army representatives agreed with our position on the 7.62-mm. rifle grenade cartridge. They said that due to the excess position, the Army has taken action to delete the fiscal year 1981 program and realine the funds to other ammunition shortfalls in the fiscal year 1981 program. They also said that with the deletion of the fiscal year 1981 program, the Army recommends the fiscal year 1982 program be retained. The Army's action to delete the fiscal year 1981 program is consistent with a recommendation we made after reviewing the Army's fiscal year 1981 ammunition program. While this action will reduce inventories, our computations show that the fiscal year 1982 program can also be deleted because the Army will have enough rifle grenades from the fiscal year 1980 program to meet anticipated needs through the 1983 program period.

ITEMS REQUIRING SPECIAL ATTENTION

The Army is requesting $180.9 million for the following items which have encountered some technical, production, or performance problems:

--$101.8 million for the 155-mm. M483A1 improved conventional munition projectile.

--$58.2 million for the 105-mm. M456A2 high explosive antitank cartridge.

--$20.9 million for the 155-mm. M549A1 rocket-assisted projectile.

Army officials are taking, or have taken, actions to correct the problems, but the problems are such that if corrective action proves unsuccessful, the reliability of items placed in the stockpile could be questionable. Because the rounds are very costly and complex, we believe care must be exercised to ensure long-term stockpile reliability and are therefore bringing the following matters to the Committee's attention.

155-mm. high explosive improved conventional munitions

The request included $101.8 million for 233,000 M483A1 projectiles. The M483A1 contains 88 dual-purpose, armor-defeating/antipersonnel grenades. These grenades are expelled during flight and disperse over the target area, providing wider, more effective coverage than conventional projectiles.

The authorized acquisition objective for this item is 11,481,000 and the inventory at September 30, 1980, was only 966,100. On the basis of the Army's fiscal year 1982 unit cost estimates, it would cost about $5 billion to buy the rounds required to meet the inventory objective. In addition, the Army is investing about $445 million into a new ammuntion plant in Mississippi to manufacture this item.

Unfortunately, this item has experienced several performance problems. During last year's hearings the Committee discussed problems with low order detonation, lack of penetration, and failure of the cargo to be expelled from the projectile. The Army claims these problems are solved. However, during the past year, two new problems have surfaced.

First, projectiles exploded in the gun barrel during ballistic testing on two separate occasions. As a result, the Army and Marine Corps have restricted their entire inventories to emergency combat use. This restriction will remain in effect until the cause of the inbore explosions is identified and any necessary modification is completed. The ongoing investigation of these incidents reveals two potential causes which may result in a substantial rework program--projectiles with inadequate tensile strength and projectiles with cracked base plugs. The Army plans to complete its investigation and issue its final report in July 1981.

Second, during component testing there were five ogive separations. The explosive charge which should expel the grenade cargo through the rear of the projectile, blew the ogive off the front of the projectile instead. The Army is also investigating this problem.

The problems discussed during last year's hearings and the new problems all occurred during production testing, however, production continued unabated while the Army worked on solutions. Given the variety and severity of the problems and the high unit

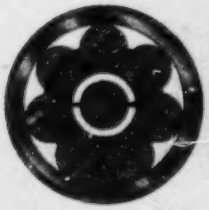
cost of the round, we question the Army's continuing high volume production while trying to resolve problems. Production should be minimized until the causes of problems have been identified and corrective actions taken. This item is complex and any rework will certainly be costly. Some redesign and/or improved quality assurance procedures may be necessary.

Further, the problems raise questions about the reliability of the projectiles in the war reserve stockpile. For example, the low order detonation problem was purportedly resolved by lowering the percentage of cyclohexanone in the composition A-5 in future production. While this might resolve future problems there could be many faulty rounds in the existing inventory. The Army tested some stockpiled M483A1 projectiles during September and October 1980, but the results were not available at the time of our review. However, recent tests of similar improved conventional munitions projectiles stored for several years revealed very high grenade malfunction rates.

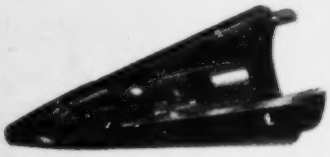
Army representatives said that there is a pressing need to buy the items during fiscal year 1982 and that the Army will closely monitor the program to assure that corrective actions on past problems are effective. They also said that they are aware of the potential functioning problems of improved conventional munitions after long-term storage. However, they have no means to age the rounds to determine effects of long-term storage.

PROJECTILE, 155MM, HE, M483A1

M42



CROSS SECTION OF PAYLOAD



OGIVE WITH SELF REGISTRATION ASSEMBLY

SOURCE: U.S. ARMY

105-mm. high explosive antitank cartridges

The request included $58.2 million for 122,000 105-mm., M456A2 high explosive antitank cartridges. We questioned funding this item in fiscal years 1979, 1980, and 1981 due to unresolved technical and production problems. The Army has taken corrective measures, but the effect of these measures has not been determined.

Technical and production problems have plagued the M456A2 and its predecessor, the M456A1. During engineering tests, several M456A2 projectiles exploded downrange before reaching the target. The Army decided to type classify the M456A2 for full production, even though the problem was unresolved, with the constraint that it not be fired over the heads of friendly troops. The current airburst rate is less than 1 out of 400, which appears high; however, the Army has made changes in production inspection methods and changed components in the full frontal area impact switch. Engineers believe these changes will reduce the airburst rate to 1 in 10,000, or better. However, the impact of the changes will not be known until production tests are completed.

A substantial portion of the Army's M456A1 field inventory is restricted to emergency combat use due to problems which caused projectiles to explode in the gun barrel. Although the exact cause has not been determined, cavitation (air pockets in the explosive fill) could cause inbore detonations. In fiscal year 1978, the Army began a project to develop a melt-pour process which would reduce the cavitation and cracking that occurred in the existing pouring process. The result is a process which has provided a 94.8-percent acceptance rate for M456A1 production. The Army expects a similar acceptance rate for M456A2 production.

Another problem plaguing the cartridge is insufficient supplies of projectile metal parts which caused production and testing schedules to slip. Corrosion on nose spikes and defective shaped charge cones halted production in January 1981. These problems have reportedly been resolved and production resumed. However, as a result of these delays, the completion date for the fiscal year 1979 program has slipped from March 1981 to November 1981. However, the Army believes that production will be on schedule by the end of its proposed fiscal year 1982 program. Finally, there is a possibility that the round may be replaced by the XM815, but the type classification date is uncertain.

Army representatives said they realize that actions to resolve problems with the high explosive antitank cartridges may not be completely effective, but because of the low asset posture, the Army recommends that the fiscal year 1982 procurement of this high priority tank round be funded.

155-mm. M549A1 rocket-assisted projectile

The request included $20.9 million for 30,000 155-mm. M549A1 rocket-assisted projectiles. The quantity has since been increased to 41,000 projectiles because the Army has earmarked $8 million of available component inventory to be used in the program.

The Army canceled its fiscal year 1981 request for the M549A1 after ultrasonic testing indicated high rates of unacceptable cracks in the warheads. Officials have since attributed this problem to both inaccurate testing equipment and the brittle characteristics of the high fragmentation steel used in the projectile. Despite added projectile machining, rejection rates have continued at 20 percent. More sophisticated ultrasonic testing equipment has been ordered, and the projectile contractor is storing rejects for retesting. Some officials believe that ultrasonic testing has been prematurely introduced into ammunition testing, and the Army is studying additional nondestructive testing methods. In addition, the Army is studying alternative methods for producing high fragmentation steel, which could reduce the crack problem. There also is potential for one ultrasonic test to be eliminated. This would lower the unit cost of the round by about $25.

Army representatives said they believed continued production of the rocket-assisted projectiles with high fragmentation steel is prudent because of the increased lethality benefits notwithstanding the past production problems.

CONCLUSIONS

We believe (1) the Congress should not provide the total amount of funds requested for two ammunition items because existing funded programs can be extended to maintain both a more uniform and active production level, (2) it is premature to provide funds for three items because various technical or production problems are unresolved, and (3) four items should not be procured during fiscal year 1982 because inventory exceeds requirements.

In addition, the Army's request for three ammunition items requires special attention because of technical, production, and performance problems.

RECOMMENDATIONS

We recommend that the Committee reduce the Army's ammunition appropriation request by $133.6 million for eight items as shown in appendix I. Also, the Committee should closely monitor the ammunition program for three items until the Army resolves various problems.

CHAPTER 3

NAVY AMMUNITION ITEMS

The Navy's amended fiscal year 1982 request, Other Procurement, Navy Appropriation, included $419.7 million for 21 ammunition budget line items. We examined the Navy's justifications for selective items in six different program budget lines representing $200.6 million, or 48 percent, of the total ammunition request.

We believe the Navy's fiscal year 1982 ammunition program should be reduced by $13.8 million because:

--About half or $3 million requested for the MK82 conical fin is premature because half of the requested quantities will not be delivered until after the fiscal year 1982 funded delivery period.

--About $4.1 million of the $5.7 million requested for the MK84 inert practice bombs is not needed because bomb bodies can be used from existing stocks rather than buying new ones.

--The $6.5 million requested for the 5-inch/54 caliber variable time nonfragmentation projectile is not needed because the Navy already has an adequate inventory to satisfy projected needs.

--The $0.2 million requested for 5.56-mm. linked cartridges is not needed because of a production backlog.

CONICAL FINS FOR MK82 PRACTICE BOMBS

The Navy's budget request includes $6 million for 64,900 conical fins for MK82 bombs. About half of the requested amount is not needed at this time because 32,500 of the fins would be delivered after the fiscal year 1982 funded delivery period, which ends in September 1983. Therefore, we believe funding for 32,500 conical fins should be deferred until fiscal year 1983.

Navy representatives disagreed with our position on the MK82 conical fins. According to the representatives, this item has a procurement leadtime of 18 months and its funded delivery period ends in April 1984 rather than September 1983 which we indicated earlier. It appears that the Navy has changed the funded delivery period since our work to justify the fiscal year 1982 procurement program. We believe it would be more appropriate to adjust the ammunition program.

MK84 INERT PRACTICE BOMBS

The request includes $5.3 million for 3,841 nonthermal protected MK84 inert practice bombs. The request for nonthermal

protected bombs is overstated by $3.9 million because the Navy inappropriately requested funding for bomb bodies.

The fiscal year 1981 approved program provided funds for 3,841 nonthermal protected MK84 bomb bodies; the fiscal year 1982 request is to provide funds for the inert loading of the bomb bodies. Since the estimated unit cost for inert loading is approximately $379.17, a total of $1.4 million, rather than $5.3 million, is needed for the fiscal year 1982 program. Navy officials attribute the inclusion of funding for the bomb bodies to confusion over how the Army's new working capital fund will work.

Navy representatives agreed that funds were provided in fiscal year 1981 to procure 3,841 bomb bodies for the MK84 inert nonthermal protected bombs and that the fiscal year 1982 program should include only the cost of inert loading these bombs. However, Navy representatives said the Army single manager plans to charge the Navy the full price, that is, without granting credits for the bomb bodies procured in fiscal year 1981. Since there is no need to buy additional bomb bodies, we believe that funds should not be provided for them.

MK81 INERT BOMBS

The Navy is requesting $386,000 for 1,400 MK81 inert bomb bodies. The Navy's request could be reduced by about $227,000 if it would use MK81 bomb bodies from existing stock rather than purchasing new ones. According to Navy officials, more than 12,000 MK81 bomb bodies are in storage at the Hawthorne Army Ammunition Plant. The inventory objective is 1,100.

Using the available MK81 bomb bodies would reduce the funding request by $162 for each bomb, or a total of about $227,000.

The Navy representatives agreed that sufficient MK 81 bomb bodies are available in stocks to load the 1,400 units programed in fiscal year 1982. However, they said that they cannot confirm that the Army pricing includes $227,000 for procurement of bomb bodies. Our review did confirm this and accordingly we believe funds should not be provided to buy additional bomb bodies since they are already available in stocks.

5-INCH/54 CALIBER VARIABLE TIME NONFRAGMENTATION PROJECTILE

The request includes $6,470,000 for 16,992 5-inch/54 caliber variable time nonfragmentation projectiles that are used only for training purposes.

At September 30, 1980, a total of 331,700 rounds of various types of 5-inch/54 caliber projectiles were due in from fiscal year 1981 and prior year programs. The Navy believes this backlog can be eliminated and the 1982 program produced within the fiscal year 1982 funded delivery period. Due to the relatively

low inventory position for several 5-inch/54 caliber projectiles, we believe the fiscal year 1982 program should be approved except for the variable time nonfragmentation projectiles.

We evaluated the Navy's 1982 request for the variable time nonfragmentation rounds using current data provided by the Naval Sea Systems Command. We found that if the fiscal year 1982 request is approved, the projected inventory at the end of the fiscal year 1982 funded delivery period will exceed the inventory objective by 14,600 rounds, almost all of the requested quantity. If the 1982 buy is postponed, the projected inventory at the end of the fiscal year 1982 funded delivery period would be 13,600, or approximately 85 percent of the inventory objective. Deferment of the request for this round would not compromise readiness since this round is used only for training purposes.

Navy representatives said that as a result of an inventory gain of 15,000 5-inch/54 variable nonfragmentation projectiles in 1980, there is no longer a need to procure this round in fiscal year 1982. However, the Navy would like to use the funds to procure other ammunition items where shortages exist, such as 76-mm. and other 5-inch/54 caliber ammunition.

5.56-MM. LINKED CARTRIDGE

The request includes $163,000 for 240,000 5.56-mm. linked cartridges. As of September 30, 1980, a total of 378,000 serviceable cartridges were in inventory and 2,119,000 cartridges were due in from fiscal year 1977 through 1980 programs. Production of the cartridge is currently suspended because XM27 links are not available.

From data provided by the Navy, we found that the inventory position at the end of the fiscal year 1982 funded delivery period will exceed the inventory objective by 28,000 cartridges without the fiscal year 1982 program. Based on this asset position and the large production backlog the fiscal year 1982 program is unnecessary and should be deleted.

Navy representatives agreed that there is no longer a need to buy 5.56-mm. linked cartridges in fiscal year 1982 because continuing technical problems have delayed delivery of the prior year orders until late fiscal year 1981 or early fiscal year 1982. They said that the Navy would like to use the funds to procure other small arms ammunition items where shortages exist.

CONCLUSION

We believe that the amounts needed for two items is less than the amounts requested and that it is premature to fund two additional items.

RECOMMENDATION

We recommend that the Committee reduce the Navy's fiscal year 1982 ammunition appropriation request by $13.8 million for four items as shown in appendix II.

CHAPTER 4

AIR FORCE AMMUNITION ITEMS

The Air Force fiscal year 1982 appropriation request for ammunition was $1,120.7 million. We examined the Air Force's justification for 15 of 53 items, representing $439.7 million, or 39 percent of the request, and concluded that the request for most items is justified. However, funding for two items is questionable for the following reasons:

--The $7.2 million requested for .38 caliber ammunition can be reduced either by using lower cost rounds for training ($4.7 million), or by procuring the rounds from the commercial sector ($1.9 million).

--The $8.6 million requested for RR-170 chaff cartridges is unnecessary because of production backlog.

.38 CALIBER BALL CARTRIDGE

The request includes $7.2 million for 32.3 million .38 caliber ball cartridges at a unit cost of $0.23. The unit cost was furnished by the U.S. Army Armament Materiel Readiness Command and is based on production at the Lake City Army Ammunition Plant.

Lower cost round may be available

During our review, we initially concluded that the Air Force could reduce its 1982 request for .38 caliber ammunition by about $4.7 million if the Air Force purchases for training purposes the less expensive .38 caliber wadcutter cartridge rather than the .38 caliber PGU 12B, which was requested in the budget. According to Air Force officials, the wadcutter is a commercially designed lead bullet that is not acceptable for combat use in accordance with the Geneva Convention, but can be used for qualification training, the major requirement for .38 caliber ammunition. During the development phase of the PGU 12B, the Air Force used over 78 million .38 caliber wadcutter cartridges for its training needs.

An Air Force procurement official estimated that the wadcutter round could be purchased for about $0.08 to $0.09 per round. Accordingly, using an estimated cost of $0.085 per round, we estimated that the Air Force could reduce its fiscal year 1982 request for .38 caliber ammunition by about $4.7 million.

Air Force engineering and reliability officials do not recommend using the wadcutter for training since it has caused some problems, such as leaded bores and bullets in the bores. The wadcutter is still carried in the Air Force inventory and is being used for qualification training by the Office of Special Investigation. Also, the current PGU 12B inventory meets the war readiness materiel requirement. Because of these circumstances,

we believe there is a potential to use the less costly wadcutter for training.

In discussing a draft of this report, Air Force representatives provided us with extensive additional information on why the .38 caliber PGU-12 high speed ammunition round is used for training rather than the less expensive wadcutter round. The Air Force also provided the same information to the Subcommittee on Defense of the House Committee on Appropriations. Generally, the Air Force said that it is important for military personnel to be qualified with the same ammunition as that used in combat; little similarity exists between the two rounds; and separate programs would complicate training and inventory management. The Air Force also cited safety and potential environmental problems with using the wadcutter round indoors.

While the Air Force position seems reasonable, we did not have the time to fully evaluate it and therefore are unable to take a firm position on this matter. We plan to pursue this issue further during future reviews in the ammunition area.

Overstated cost estimate

The last program for the PGU-12B round was the fiscal year 1980 program (there was no fiscal year 1981 procurement) which Congress approved for 31.5 million rounds at a total cost of $5.6 million. The quantity was subsequently reduced to 29.6 million rounds because the Army increased the unit price. On an even earlier procurement of .38 caliber ammunition, the Air Force expressed concern about an Army unit price increase of $0.07 and recommended that the procurement be awarded on a competitive basis. Although the Army did not compete the earlier procurement, a competitive contract was awarded for part of the fiscal year 1980 program. An order for 6.5 million rounds at a unit cost of $0.1877 was placed with the Lake City Army Ammunition Plant, and a contract for 23.1 million rounds at a unit cost of $0.1424 was awarded to Olin Industries. Because of yet another price increase to $0.1946 and the unavailability of additional fiscal year 1980 funds at that time, Lake City actually produced only 5.03 million rounds. Olin Industries has agreed to produce the total fiscal year 1980 shortfall of 3.4 million rounds at a unit price of $0.14875.

An Air Force procurement official estimated that if the fiscal year 1982 program is produced on contract, the unit cost would be about $0.17 a round. At $0.17 each, the total cost would be about $5.5 million, or $1.9 million less than the requested amount.

Air Force representatives said that the Air Force procures the .38 caliber ammunition from the Single Manager for Conventional Ammunition (i.e., the Army), and for budgetary purposes, the Air Force used the fiscal year 1982 unit price which the Army provided. The Air Force is agreeable to the reduction if the requested quantity can be procured at the lower cost.

PRODUCTION BACKLOG FOR RR-170 CHAFF CARTRIDGE

The Air Force budget request includes $8.6 million for RR-170 chaff cartridges. The cartridge, used in the A-7, A-10, and F-4 aircraft, expels chaff as an electronic countermeasure against radar-controlled threats.

The procurement program for the RR-170 has experienced significant production delays. The approved programs for fiscal years 1978, 1979, and 1980 total 3,423,000 cartridges, of which 3,239,000 remain undelivered as of January 31, 1981.

Fiscal year	Approved quantity	Cost	Undelivered quantity
		(millions)	
1978	865,000	$3.4	681,000
1979	1,200,000	5.0	1,200,000
1980	1,358,000	4.7	1,358,000

The production delays were caused by faulty cartridge end caps that fell off the cartridge when handled by aircraft loading crews. Air Force officials said that a new end cap has been developed and that it now functions satisfactorily. The Air Force is currently buying the improved caps from one contractor and furnishing them to the contractors producing the fiscal year 1978 program. According to Air Force officials, the revised specifications for the end cap will be incorporated in the fiscal years 1979 and 1980 programs.

The January 31, 1981, production schedule forecasts completion of the fiscal year 1978 program in July 1981; however, the Air Force item manager predicts slippage to September 1981 based on the producers' previous production history. Production for the fiscal year 1979 program was originally forecast to start in July 1979 and be completed in June 1980, and production for the fiscal year 1980 program was forecast to start in July 1980 and be completed in June 1981. The 1979 and 1980 programs are now forecasted for completion in December 1981 and December 1982, respectively. However, the Air Force contract administrator believes that the production on both fiscal year programs will start in November 1981 and be completed by September 1982. Production on the fiscal year 1982 program is forecast to start in March 1983 and be completed after September 1983.

The Air Force representatives said that the Air Force procures the RR-170 chaff cartridges from the Navy which has management responsibility for the item. The Navy advised the Air Force that the requested fiscal year 1982 procurement quantity and the earlier funded program quantities will be delivered within the fiscal year 1982 funded delivery period. Based on past

experiences, it is highly questionable that the quantities being requested for fiscal year 1982 could be delivered on schedule.

CONCLUSION

We believe that there is a potential for the Air Force to use the .38 caliber wadcutter round for its training needs. The .38 caliber PGU 12B round could be procured commercially at a lower cost. It is premature for the Congress to provide additional funds to produce the RR-170 chaff cartridges in fiscal year 1982 because of production backlogs.

RECOMMENDATION

We recommend that the Committee:

--Reduce the Air Force's appropriation request by $1.9 million for the .38 caliber PGU 12B rounds to bring the request more in line with the unit cost estimate for procurement of this item from a commercial source.

--Reduce the Air Force's request by $8.6 million for the RR-170 cartridge because of production backlogs.

CHAPTER 5

AMMUNITION PLANT MODERNIZATION AND EXPANSION PROGRAM

The Army's January 1981 request included $125.5 million for 17 projects to modernize and expand the ammunition production base. The Army plans to use the funds for a wide variety of projects, such as

--establishing initial production facilities for an Air Force antiarmor cluster munition and tactical munitions dispenser,

--distributing excess equipment to active producers,

--meeting a shortfall in completing the Mississippi Army Ammunition Plant,

--modernizing a contractor-owned plant which produces metal parts for several Navy high explosive projectiles,

--correcting deficiencies in several existing facilities completed under earlier modernization projects, such as a Composition B explosive line at Holston and an ammonia oxidation plant at Radford Army Ammunition Plants, and

--providing omnibus engineering funds for process equipment and construction designs. (See app. IV for a complete project listing.)

Because of time constraints, we limited our review to nine projects representing $91.9 million, or 73 percent, of the total request. We believe both the Army and the Congress should carefully examine certain issues on the following three projects.

Project number	Description	Amount requested (millions)	Remarks
5822134	Steam tieline to horseshoe area at Radford Army Ammunition Plant	$ 9.5	Alternatives not evaluated, questionable economic justification
5823186	Active munition metal parts facility	5.8	Premature, project scope not finalized
5823142	Sixth phase Mississippi Army Ammunition Plant	10.5	Potential further cost growth

PROJECT 5822134

This $9.5 million project is for constructing a 10,000 foot steam conduit or tieline plus related items at the Radford Army Ammunition Plant. The Munitions Production Base Modernization Agency evaluated the project's justification and concluded that the project should be withdrawn from the 1982 program. The Agency proposed that several aspects of the project be validated before resubmission.

Radford's production facilities are separated by the New River. The main area contains most of the facilities and the horseshoe area contains fewer, but more critical facilities. Each area contains a plant to produce the steam for its production processes and heating needs. The tieline would connect the main area steam plant to the horseshoe area facilities.

The project's primary justification was identified as the estimated savings from shutting down the horseshoe area plant and using the main area plant to produce all the steam. The estimated savings is questionable from two aspects--estimated costs and the need for both plants if mobilization should occur.

The project's cost estimates have more than doubled from the March 1980 $4.2 million to the present $9.5 million. The increase has correspondingly reduced the savings to investment ratio that the Agency uses to measure a project's economic justification. Furthermore, our analysis revealed several discrepancies in estimated costs to operate the main area plant and to layaway and maintain the horseshoe area plant.

The potential savings as justification is also questionable because the capacity from both steam plants would be needed if mobilization should occur. The combined existing capacity would meet only about two-thirds of mobilization requirements.

To meet this shortfall, the Agency is planning to replace the main area plant with a larger capacity plant. The new plant, in the Agency's 1987 program, at an estimated $300 million cost, would meet Radford's requirements at all times. The Agency considers the tieline as only the initial step to meet the shortfall.

Following an analysis of the savings to investment ratio and an evaluation of the project justification, the Agency concluded that the project should be withdrawn from the 1982 program. The Agency considered the cost discrepancies we identified, some empirical estimates on alternate approaches to meet the shortfall, and other cost and steam capacity data.

Before resubmission for future funding, the Agency proposed to (1) validate cost data for the tieline and alternate approaches, (2) further evaluate the horseshoe area steam plant, and (3) validate Radford's actual steam requirements.

We agree with the Munitions Production Base Modernization Agency that this project should be withdrawn from the 1982 program. We further agree that the project should be resubmitted only after further analysis determines the most feasible solution to Radford's modernization/expansion needs. We believe the potential large investment warrants evaluating all feasible alternatives.

Army representatives from the Office of the Deputy Chief of Staff for Research, Development and Acquisition agreed with our position on the $9.5 million project for the tieline to the horseshoe area at Radford. However, they said that the Army would like to use the funds for expected cost increases in the Mississippi project and for the omnibus design line.

They said that the Mississippi facility project is expected to have additional cost growth and that although every effort is being made to minimize the cost increases, there is a capital investment cost for tape stiffener assembly machines that is not included in the project and other expected increases of $1.75 million for equipment. They also said that they would like to increase the omnibus engineering funding for fiscal year 1982 by $4 million to support the expected future increases in the ammunition production base programs.

PROJECT 5823186

This $5.8 million project is the first phase of a two-phase program to distribute excess equipment to active producers from the Gateway, Hays, and St. Louis Army Ammunition Plants. The second phase, estimated to cost $42.2 million, is planned for fiscal year 1983. The excess will replace wornout equipment or prevent buying new equipment for planned or existing production lines.

Some of the equipment has been tentatively allocated in response to requests from active producers who have inspected the equipment. However, the distribution planning for this equipment is only in the preliminary stage. The scope of effort has not been defined and firm cost estimates have not been established.

Detailed scope and firm cost estimates for the overall effort will not be known until a technical data package containing equipment removal, rehabilitation, installation specifications, and associated costs is completed. The completion, scheduled for November 1981, depends on the receipt of proposals from contractors who want the equipment. The Army is requiring the proposals to contain

--contractors' firm cost estimates,

--plant layout information and narrative on integrating the equipment into a production line,

--identification of equipment for replacement,

--identification of ancillary equipment that will be needed and its estimated cost, and

--effect of using the relocated equipment on production capability.

A detailed plan for distributing and utilizing the excess has not been developed. Part of the planning will involve establishing criteria for determining priorities among contractors, considering cost benefits and alternatives, validating contractors' proposals, and identifying needs of other projects.

The Army's efforts to distribute the excess appears warranted since it can be used to meet current or planned production needs at various producers. The excess includes a wide variety of several hundred pieces of equipment, some new. For example, most of the 192 pieces of production equipment that were purchased to modernize the St. Louis 105-mm. M1 shell production lines were never installed. Sharp reductions in requirements and other changes impacted on planned use. The new equipment includes five 2,000-ton capacity four stage mechanical forging presses, 166 lathes, and various other equipment. Of course, the need for this equipment to remain in the St. Louis Army Ammunition Plant could be reestablished by a sharp increase in requirements for the 105-mm. M1 shell. In fact, only recently we questioned the Army's plan to build a plant for the shell at the Lone Star Ammunition Plant because of the existing capability at the St. Louis plant.

We concur with the basic objective of updating and improving ammunition production lines. We also concur with the view that using the excess equipment rather than buying new equipment can result in considerable cost savings. We believe, however, that implementing this program with inadequate planning and limited funding can result in a fragmented approach and possibly unnecessary costs without achieving the desired objective. Considering the status of planning as seen in the lack of firm cost estimates and undefined scope, this project appears premature for fiscal year 1982 funding.

Army representatives did not agree with our findings concerning the $5.8 million project for distributing excess equipment. They said that a final design for this project is not applicable since no design is needed, but that a plan for the allocation and reuse of the equipment is needed and does exist. Army representatives also said they considered the cost estimates valid since they were based on numerous previous installation/debug efforts performed throughout the base.

As discussed above, a detailed plan for distributing and utilizing the excess equipment and firm cost estimates for the project have not been developed and the plan is not scheduled

for completion until November 1981. Considering the incompleteness of the planning for the project, we continue to believe it would be premature to fund the project in fiscal year 1982.

PROJECT 5823142

This $10.5 million project, primarily for equipment installation, is the Army's sixth request for funds to construct an ammunition plant at Bay St. Louis, Mississippi. When finished, the plant will be able to produce components for the 155-mm. M483A1 improved conventional munition and to assemble these into complete rounds of ammunition.

The Army thought the $185.8 million requested in fiscal year 1981 would complete the plant. However, the Army found an additional $29 million is needed to cover a shortfall which accrued since 1978. The $29 million shortfall consists of $9.1 million for construction and $19.9 million for equipment. This amount is being partially funded by this $10.5 million project and through reprograming actions. The construction cost growth resulted primarily from numerous engineering changes to the $46 million projectile metal parts building and site development. The equipment cost growth is due to (1) a higher actual inflation rate than used to develop cost estimates, (2) inaccurate budget estimates, and (3) inaccurate equipment cost estimates.

An early estimate to construct the plant was $397 million. However, the cost estimate in 1979 to complete the plant was $416.4 million and is now $445.2 million. This estimate includes $255.9 million for equipment, $181 million for construction, and $8.3 million for engineering support. The total plant cost does not include an estimated $37.2 million needed for prove out. Prove out will begin in fiscal year 1981 with the projectile metal parts building. The Army expects to recover about $17.2 million of this $37.2 million through M483A1 procurements. A fiscal year 1982 production order for 40,000 rounds and a 1983 order for 150,000 rounds is planned.

The Army believes the plant will be completed on schedule in December 1983 at the estimated cost of $445.2 million. However, there is still a need for considerable construction effort, gauged by reported completion of facilities.

Contracts estimated to cost $45.5 million have not been awarded. In addition to these unawarded contracts and the potential for engineering changes to facilities under construction, some designs have not been completed. For example, the designs for a 13,800 volt powerline and an industrial waste treatment plant are still in early stages. Also, only $86.3 million of an estimated $255.9 million in equipment contracts required had been awarded as of February 1981.

CONCLUSIONS

We believe that (1) the Munitions Production Base Modernization Agency's proposal to withdraw the tieline to the horseshoe project at Radford from its fiscal year 1982 program is correct and that further analysis of alternatives is needed before the project is resubmitted for funding, (2) planning for redistribution of excess equipment is not far enough advanced to justify inclusion in the fiscal year 1982 program, and (3) still further cost growth at the Mississippi plant is highly probable.

RECOMMENDATIONS

We recommend that the Committee reduce the Army's fiscal year 1982 request for modernizing and expanding the ammunition production base as follows:

--Defer the $9.5 million project for the tieline to the horseshoe area at Radford Army Ammunition Plant until a detailed plan using the most cost-effective approach to the steam generating capacity is developed.

--Defer the $5.8 million project for distributing excess equipment until the full scope of effort is determined and a detailed plan, including firm cost estimates, is developed.

CHAPTER 6

OTHER MATTERS

Significant problems continue with the implementation of the single manager for conventional ammunition and with the 155-mm. Copperhead system, both subjects of earlier GAO reports. 1/

Progress has been limited toward further implementing the single manager concept. We believe the concept is sound and that if fully implemented, it will maximize efficiency, economy, and effectiveness in ammunition management.

Problems concerning Copperhead's effectiveness against moving targets and under battlefield conditions have not been resolved. The Army is forecasting considerable cost increases for the fiscal year 1980 program and is planning Copperhead II, which is supposed to enhance certain features of the system.

SINGLE MANAGER FOR CONVENTIONAL AMMUNITION

To streamline conventional ammunition management, the Deputy Secretary of Defense issued Department of Defense Directive 5160.65 on November 26, 1975, assigning the Secretary of the Army as single manager for conventional ammuntion. The objectives were to

> "Integrate conventional ammunition logistics functions of the Military Departments to the maximum extent practicable thereby eliminating unwarranted overlap and duplication, and
>
> "Achieve the highest possible degree of efficiency and effectiveness in the DOD operations required to provide top quality conventional ammunition to U.S. forces during peacetime and mobilization."

The single manager concept was to be implemented in two phases--phase I during fiscal years 1977-78 and phase II during fiscal years 1979-80. Phase I was to achieve partial implementation with expansion to a full single manager in phase II.

Our November 26, 1979 report discussed implementation problems and identified managerial and organizational changes needed to fully implement the centralized management concept. In response to our report, Defense agreed that changes were needed to

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1/"Centralized Ammunition Management--A Goal Not Yet Achieved" (LCD-80-1, Nov. 26, 1979) and "Future Procurements of Army's Copperhead Projectile Should be Contingent on Improvements in Performance and Reliability" (C-PSAD-81-4, Nov. 13, 1980).

modify ammunition management and to strengthen the organization. Subsequent actions, however, provided few changes.

The services, single manager, and elements within the Office of the Secretary of Defense, in essence, voted on our recommendations. The responses varied from almost total acceptance to almost total rejection. All the services agreed that the single manager organization should be strengthened and that Defense should provide funds to the Army for the additional costs incurred by the Army in carrying out the single manager mission.

Perhaps the most notable change since our report has been the Air Force's agreement to give the single manager visibility over retail assets. However, this change falls far short of our recommendation that a national inventory control point be established. Another change has been the assignment of top quality Air Force, Navy, and Marines Corps personnel to responsible positions in the single manager's organization. Also, the Army has placed the U.S. Army Munitions Production Modernization and Expansion Agency under the control of the single manager.

Finally, at time of our review, Defense was working on a revised directive which would add to the single manager's control and strengthen its organization. The effect of the revised directive is unknown.

Some proponents of the single manager concept contend that further implementation of the single manager concept may be inhibited by assigning staff responsibility to the Under Secretary of Defense for Research and Engineering. This criticism is based on the purported research rather than logistics orientation. They advocate assigning responsibility to an Office of the Secretary of Defense element with logistics expertise--the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics). Since the Under Secretary of Defense for Research and Engineering is responsible for acquisition, the assignment of the single manager is logical from an organizational standpoint. However, from a functional standpoint alinement with a logistics-oriented office may be more appropriate since the single manager is more closely associated with logistics than research. The draft revised directive assigns responsibility for logistics supply and guidance to the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics) and responsibility for financial management policy and guidance to the Assistant Secretary of Defense (Comptroller). The Under Secretary of Defense for Research Engineering retains responsiblity for single manager activities and provides acquisition policy and guidance.

Our position on centralized management was clearly stated in our November 1979 report and the single manager shares our views. Further, in a January 21, 1981, letter to the Secretary of Defense, we discussed the potential for savings by further centralization. We believe central control over procurement and production functions will achieve greater efficiency and economy

in peacetime operations. More important, greater central control over inventory management should provide for improved Defense-wide logistics support in the event of war.

COPPERHEAD

Copperhead, a projectile fired from a 155-mm. howitzer, was developed to provide a high probability of hitting moving or stationary targets, such as armored vehicles and field fortifications. It will home on reflected energy created by aiming a laser beam on a target.

In our earlier report, we discussed three issues relating to the Copperhead system's performance: (1) effectiveness against moving targets, (2) effectiveness in battlefield conditions, and (3) uncertain reliability. Each of the issues identified questionable or limited performance capability.

The system's effectiveness against moving targets is questionable based on evaluations of its capability and responsiveness by the U.S. Army Materiel Systems Analysis Activity, the Human Engineering Laboratory, and the Operational Test and Evaluation Agency. Copperhead's effectiveness against moving targets is critical since two-thirds of the enemy targets are expected to be moving. Two of the organizations found that the system may not be responsive enough against moving targets. The third found operationally acceptable response times in simulated, but not in live, firings.

Battlefield effectiveness may be limited by numerous natural and enemy-induced factors--cloud cover, adverse weather, smoke, line-of-sight interruptions, and enemy countermeasures. Operational testing, completed in 1979, confirmed the doubtful effectiveness, except under favorable conditions. After 42 of 71 firings missed the target, the independent evaluation agency concluded that the Copperhead is effective against both stationary and moving targets in a favorable environment, but that battlefield conditions may so limit its use that the extent of its contribution to the antiarmor battle is questionable.

The reliability estimates for Copperhead following testing ranged from 45 to 72 percent. This low reliability resulted in a Secretary of Defense decision to limit Copperhead's production rate to 200 rounds per month until a reliability of at least 80 percent is demonstrated.

In our earlier report, we concluded that the Secretary of Defense appropriately limited Copperhead's procurement rate to 200 rounds per month, pending the elimination of problems which affect its reliability. We also concluded that the total quantity to be procured should be contingent on the Army's ability to achieve a response time sufficient to assure that Copperhead will successfully engage moving targets--a major reason for initiating its development.

We recommended in our earlier report that the Copperhead's production rate be limited until it attained the required level of reliability and that the need for procuring the total quantity of the Copperhead program be reassessed if the Copperhead does not demonstrate the required responsiveness against moving targets.

In February 1981 Army officials said there have been no additional formal evaluations of the moving target issue. Concerning effectiveness under battlefield conditions, the Army developed a seeker that improves performance in smoke. Testing showed the seeker can home on any target visible through the day or night sight of the ground laser locator. On the basis of results of component testing, a project office engineer concluded that the causes for reliability failures in development testing were corrected.

The Copperhead's low reliability was attributed, in part, to a container which provided inadequate insulation against shock and vibration. The Army contracted for a new clamshell container. In a test report issued in October 1980, the contractor concluded that the new container will dramatically reduce vibration response levels and increase Copperhead's reliability. Further testing to evaluate the Copperhead includes a 75-round reliability demonstration test scheduled for March 1982 and a follow-on evaluation scheduled for October 1983.

The Army's original fiscal year 1982 request was $115.7 million for 4,229 Copperhead projectiles. In March 1981, the Army increased the request to $141.7 million for 4,550 projectiles. The Army received $71.2 million for 2,100 projectiles in 1980 and $122.1 million for 4,300 projectiles in 1981. The Copperhead was approved for production in December 1979, however, as indicated earlier, the Secretary of Defense limited production to 200 rounds per month until its demonstrated reliability reaches 80 percent.

The Army awarded a contract to procure the first 2,100 Copperhead rounds, estimated to cost $63 million, on March 7, 1980. However, Army officials said the cost to procure the first buy escalated and will result in delivery of less than 2,100 rounds. Funds provided in fiscal year 1981 will be used to complete the fiscal year 1980 buy and procure an estimated 2,100 additional rounds. Remaining fiscal year 1981 funds, according to Army officials, will be used to procure projectile containers and to provide for Government support, testing, and contingencies.

The first 37 rounds delivered will be used to prove out the production facilities. The prove out rounds were scheduled for completion in April 1981. First article testing is scheduled to begin in August 1981. Pacing areas for this effort, which may impact the forecasted schedule, include completion of the prove out round testing, the prime contractor's plans to relocate electronics and control assembly lines, and completion of subcontractor and subassembly first article testing.

A Copperhead II development program, estimated to cost $140 million, is currently planned. It involves enhancing the warhead and extending the projectile's range and millimeter wave and infrared seekers. Development efforts on the Copperhead II program are scheduled to begin in fiscal year 1981. The production decision for the Cooperhead with an enhanced warhead and extended range is scheduled in mid-fiscal year 1983, with production to begin in early fiscal year 1985. The Army plans to request funding for Copperhead with the improved seeker in fiscal year 1988.

GAO RECOMMENDED ADJUSTMENTS TO THE ARMY'S AMMUNITION REQUEST

Item description	Budget request Original	Budget request Amended	Recommended adjustments	Adjusted amended request	Remarks
	(millions)				
Cartridge, 5.56-mm., blank	$ 9.8	$24.4	$ -	$24.4	No comment
Cartridge, 5.56-mm., SAW	4.9	4.8	-	4.8	No comment
Cartridge, 7.62-mm., all types	31.9	58.3	-0.8	57.5	Inventory exceeds requirements for rifle grenade cartridge
Cartridge, .45 caliber ball	2.9	2.8	-	2.8	No comment
Cartridge, .50 caliber, all types	53.6	77.1	-	77.1	No comment
Cartridge, 14.5-mm., all types	1.6	1.6	-1.6	-	Inventory exceeds requirements
Cartridge, 20-mm., all types	5.5	14.9	-4.2	10.7	Inventory exceeds requirements
Cartridge, 30-mm., HE-DP	12.7	12.3	-12.3	-	Premature buy
Cartridge, 30-mm., TP	1.6	1.6	- 1.6	-	Premature buy
Cartridge, 40-mm., practice, low velocity	2.2	4.5	-	4.5	No comment

Item description	Budget request Original	Budget request Amended	Recommended adjustments	Adjusted amended request	Remarks
	----------(millions)----------				
Cartridge, 60-mm., LWCMS, all types	$ 17.1	$16.7	$ -	$16.7	No comment
Cartridge, 81-mm., HE, w/fuze	21.5	44.7	-44.7	-	Premature buy
Cartridge, 81-mm., illum, w/fuze	8.5	8.3	-	8.3	No comment
Cartridge, 4.2 inch, HE	28.5	27.8	-	27.8	No comment
Cartridge, 4.2 inch, illum, w/fuze	39.6	49.4	-	49.4	No comment
Cartridge, 105-mm., HEAT-T, f/tank gun	45.2	58.2	-	58.2	Requires special attention
Cartridge, 105-mm., TP-T, f/tank gun	64.7	71.2	-	71.2	No comment
Cartridge, 105-mm., DS-TP	61.5	86.6	-	86.6	No comment
Cartridge, 105-mm. APFSDS-T	64.8	70.1	-	70.1	No comment
Projectile, 155-mm., HE, ICM (DP)	104.6	101.8	-	101.8	Requires special attention
Projectile, 155-mm., HE, RAP	21.5	20.9	-	20.9	Requires special attention
Projectile, 155-mm., HE, ADAM	75.2	105.3	-	105.3	No comment

Item description	Budget request Original	Budget request Amended	Recommended adjustments	Adjusted amended request	Remarks
	(millions)				
Projectile, 155-mm., HE, RAAMS	$ 58.4	$ 86.5	$ -	$ 86.5	No comment
Charge, 155-mm., propelling, white and red bags	79.9	97.8	-55.9	41.9	Funded programs could be extended for white bag (M119A2), inventory exceeds requirements for red bag (M203)
Projectile, 8-inch, HE, ICM (DP)	60.1	104.4	-	104.4	No comment
Projectile, 8-inch, HE, RAP	45.9	44.7	-	44.7	No comment
Charge, propelling, 8-inch, white bag	30.9	33.3	-	33.3	No comment
Fuze, proximity	45.5	44.3	-	44.3	No comment
Fuze, point detonating	12.8	12.5	-12.5	-	Funded programs could be extended
Fuze, time, f/artillery projectiles	15.7	47.4	-	47.4	No comment
Hand grenades, all types	4.6	12.0	-	12.0	No comment
Signals, all types	7.5	22.0	-	22.0	No comment
Simulators, all types	6.8	11.8	-	11.8	No comment
Components for prove out (note a)	13.0	13.0	-	13.0	No comment

Item description	Budget request Original	Budget request Amended	Recommended adjustments	Adjusted amended request	Remarks
	----------(millions)----------				
Spares and repair parts	$ .2	$ .2	$ -	$ .2	No comment
Total	1,060.7	1,393.2	-133.6	1,259.6	
Total (note b)	512.8	744.9	-	744.9	
Total	$1,573.5	$2,138.1	$-133.6	$2,004.5	

a/GAO reviewed $13 million applicable to prove out of the 105-mm. APFSDS-T (XM833) cartridge. We did not review $9.6 million applicable to other items in this category.

b/Total for conventional ammunition items, miscellaneous items and atomic materiel items not reviewed by GAO.

GAO RECOMMENDED ADJUSTMENTS TO THE NAVY'S AMMUNITION REQUEST

Item description	Budget request Original	Budget request Amended	Recommended adjustments	Adjusted amended budget	Remarks
	----------(millions)----------				
General purpose bomb	$ 6.9	$ 36.9	$ -3.0	$ 33.9	MK82 conical fin cannot be delivered during the program period
Practice bombs	31.4	30.7	-4.1	26.6	Funds for procuring MK84 and MK81 inert bomb bodies were provided in prior years
Marine location marker	5.1	5.8	-	5.8	No comment
5-inch/.54 caliber ammunition	57.4	62.7	-6.5	56.2	Adequate inventory of variable time nonfragmentation cartridges
76-mm. ammunition	33.8	35.3	-	35.3	No comment
Small arms	15.1	29.2	-.2	29.0	Production backlog for 5.56-mm. linked cartridge
Total (note a)	149.7	200.6	-13.8	186.8	
Total (note b)	155.6	219.1	-	219.1	
Total	$305.3	$419.7	$-13.8	$405.9	

a/GAO reviewed 82 percent of the original amounts for the listed items ($122.7 million).

b/Total for items in budget lines not reviewed by GAO.

GAO RECOMMENDED ADJUSTMENTS TO THE AIR FORCE'S AMMUNITION REQUEST

Item description	Budget request Original	Budget request Amended	Recommended adjustment	Adjusted amended request	Remarks
	(millions)				
Cartridge, .38 caliber	$ 7.4	$ 7.2	-$1.9	$ 5.3	Less costly item available
Cartridge, 5.56-mm	2.3	2.2	-	2.2	No comment
Cartridge, 20-mm. training	12.9	59.2	-	59.2	No comment
Cartridge, Chaff RR-170	4.3	8.6	-8.6	-	Production backlog
Cartridge, Signal MK-4 mod 3	2.1	2.1	-	2.1	No comment
Cartridge, MXU-4A/A engine starter	11.3	10.9	-	10.9	No comment
Cartridge, IMP CCU-44/B	4.7	9.3	-	9.3	No comment
MK-82 bomb, empty	18.7	40.8	-	40.8	No comment
Cluster bomb, MK-20 (Rock-eye)	25.0	92.0	-	92.0	No comment
Laser bomb guidance kit	51.6	126.6	-	126.6	No comment
Bomb, practice, BDU-33	32.3	24.6	-	24.6	No comment

Item description	Budget request Original	Budget request Amended	Recommended adjustments	Adjusted amended request	Remarks
	(millions)				
Flare, IR MJU-7B	$ 4.1	$ 11.7	$ -	$11.7	No comment
Flare, para, LUU-4B	1.1	1.0	-	1.0	No comment
M-206 cartridge flare	14.8	36.6	-	36.6	No comment
Fuze, MK-339 mech time	7.1	6.9	-	6.9	No comment
Total	199.7	439.7	10.5	429.2	
Total (note a)	260.7	681.0	-	681.0	
Total	$460.4	$1,120.7	$10.5	$1,110.2	

a/Total of conventional ammunition items, miscellaneous items, and nuclear items not reviewed by GAO.

GAO RECOMMENDED ADJUSTMENTS TO THE ARMY'S MODERNIZATION AND EXPANSION PROGRAM REQUEST

Project number	Description	Budget request (note a)	Recommended adjustment	Remarks
		(millions)		
Projects reviewed by GAO				
5820048	Initial production facility at Kansas for an Air Force anti-armor cluster munition	$ 21.0	$ -	No comment
5820050	Initial production facility at Twin Cities for an Air Force tactical munitions dispenser	6.8	-	No comment
5822052	Modernization of composition B, line 1 improvements at Holston	7.6	-	No comment
5822134	Steam tieline to horseshoe area at Radford	9.5	-9.5	Alternatives not evaluated, questionable economic justification
5822317	Modernization of ammonia oxidation plant at Radford	5.6	-	No comment
5823089	Modernization of 5-inch/.54 caliber projectile facility at Lansdowne Steel and Iron Company	7.0	-	No comment
5823142	Mississippi Army Ammunition Plant	10.5	-	Potential further cost growth
5823186	Modernization of active munitions metal parts facilities, phase I	5.8	-5.8	Premature, project scope not finalized
5823593	Modernization and rehabilitation of main heating plant in Iowa	18.1	-	No comment
	Total	91.9	-15.3	

Project number	Description	Budget request (note a)	Recommended adjustment	Remarks
Projects GAO did not review		(millions)		
5820285	Modernization of grenade hexachloroethane smoke M8 facilities at Pine Bluff Arsenal	$ 1.5	$ -	No comment
5822138	Modernization of M42/46 grenade in-process storage igloos at Kansas	1.2	-	No comment
5822142	Modernization of sodium nitrate sludge facility at Holston	.8	-	No comment
5822144	Modernization of tape stiffener assembly machine for M42/M46 grenade at Lone Star and Kansas	2.8	-	No comment
5822146	Modernization of small caliber ammunition, line 1 spare parts at Lake City	1.3	-	No comment
5823046	Omnibus engineering funds for process equipment and construction designs	23.0	-	No comment
5823106	Modernization of container distribution facility at Lone Star	2.6	-	No comment
5823594	Expansion of GEMSS load, assemble and pack facility at Iowa	.4	-	No comment
	Total	33.6	-	
Total		$125.5	-$15.3	

a/The estimates shown are those included in the Army's January 1981 request. Additional projects were added in the amended budget, increasing the total request to $187.6 million.

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